The Labyrinth: Navigating and Reforming South Africa's TVET Landscape

A Practitioner's Case for an Integrated Electrical Engineering Qualification Framework

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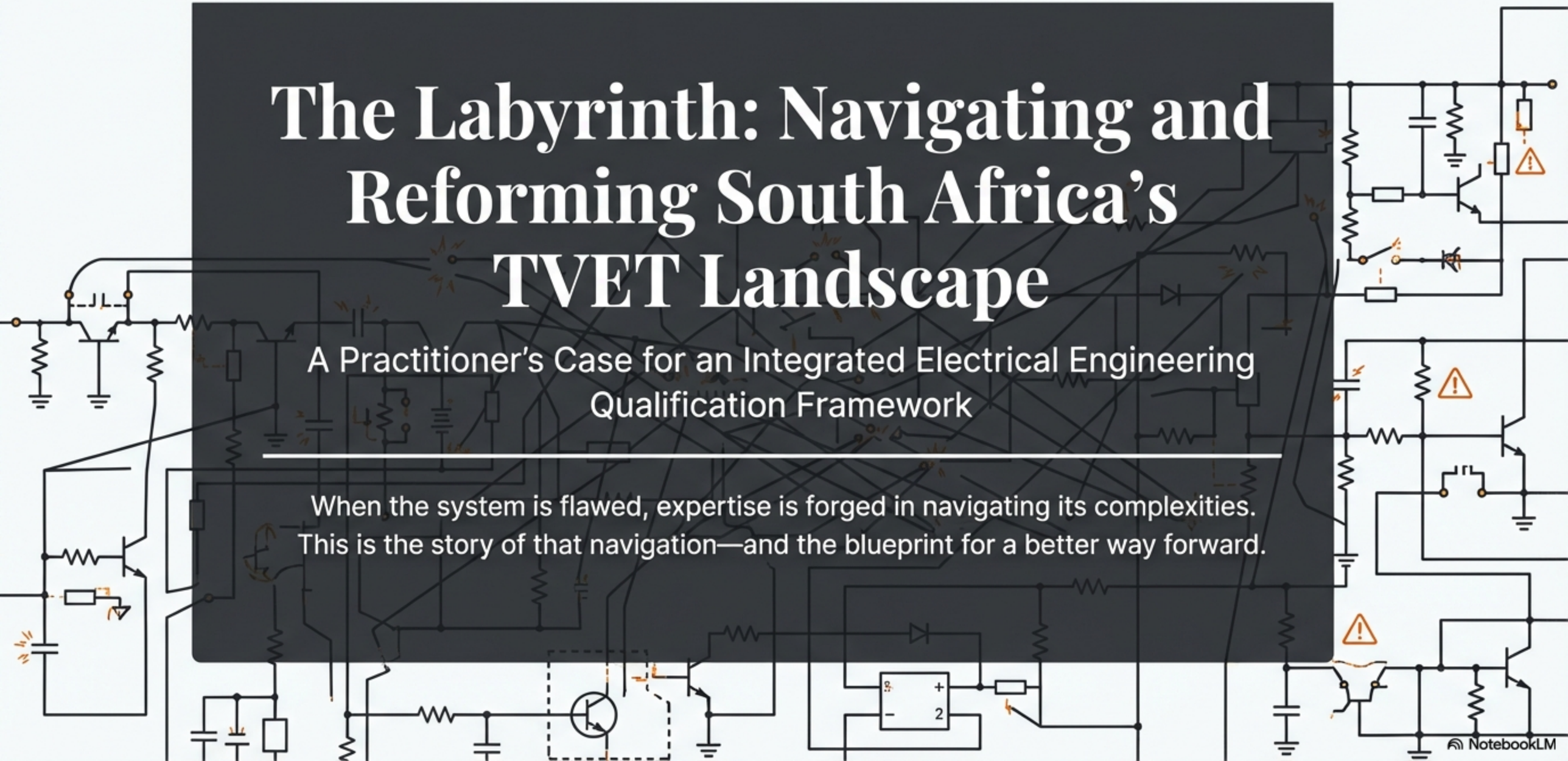
When the system is flawed, expertise is forged in navigating its complexities. This is the story of that navigation—and the blueprint for a better way forward.



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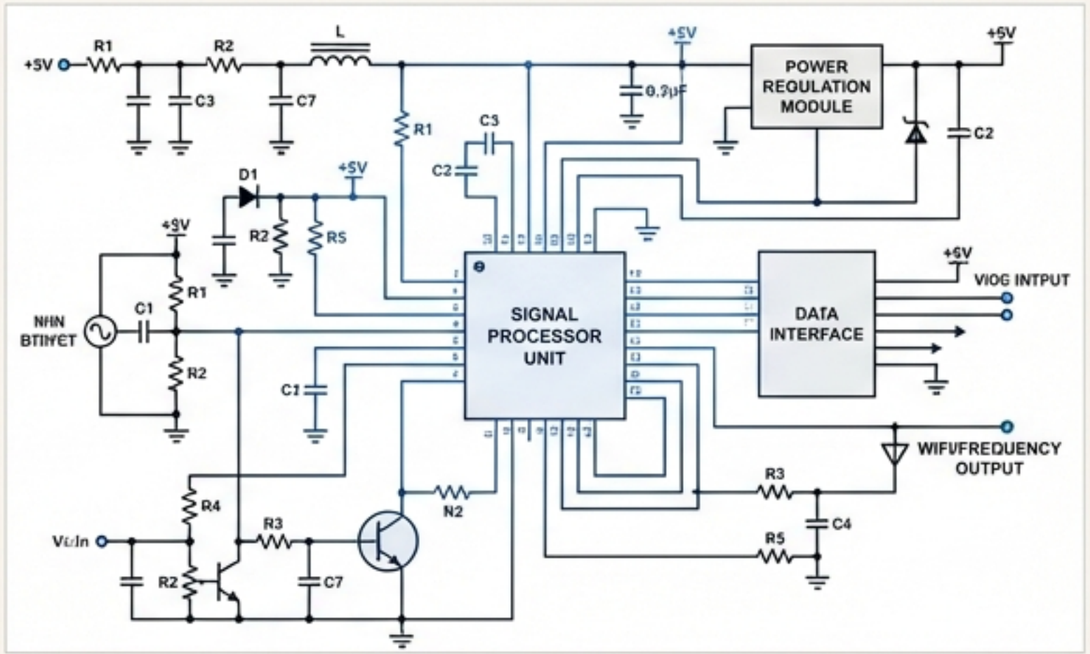
A Paradox of Prolific Work and Systemic Hurdles



This dossier chronicles the extensive work of Tshingombe Tshitadi Fiston, an engineer and educator whose journey reveals a critical disconnect. While formal systems presented barriers and rejections, a substantial body of innovative work in electrical engineering, curriculum design, and applied research was consistently produced. This is the evidence of that work.

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Diagnosing a System Marked by Friction and Delay

The Technical and Vocational Education and Training (TVET) system for engineering studies is characterized by systemic irregularities that create significant barriers for learners and lecturers.

Qualification Irregularities

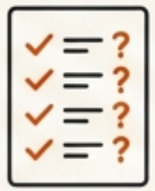
"Nated ncv combination irregularity," non-accredited qualifications, and challenges in recognizing foreign qualifications (SAQA).

Administrative Backlogs

"Slow to challenge factor learning and release resultat printed statement," "marking in progress," and extensive delays in issuing diplomas and certificates from DHET.

Curriculum Misalignment

A gap between theoretical knowledge ("trade theory") and practical, industry-relevant skills required by employers like Eskom and City Power.



Assessment Inconsistencies

"Non credible process," "irregularite material script," and a lack of standardized, fair assessment policies for Portfolios of Evidence (PoE).

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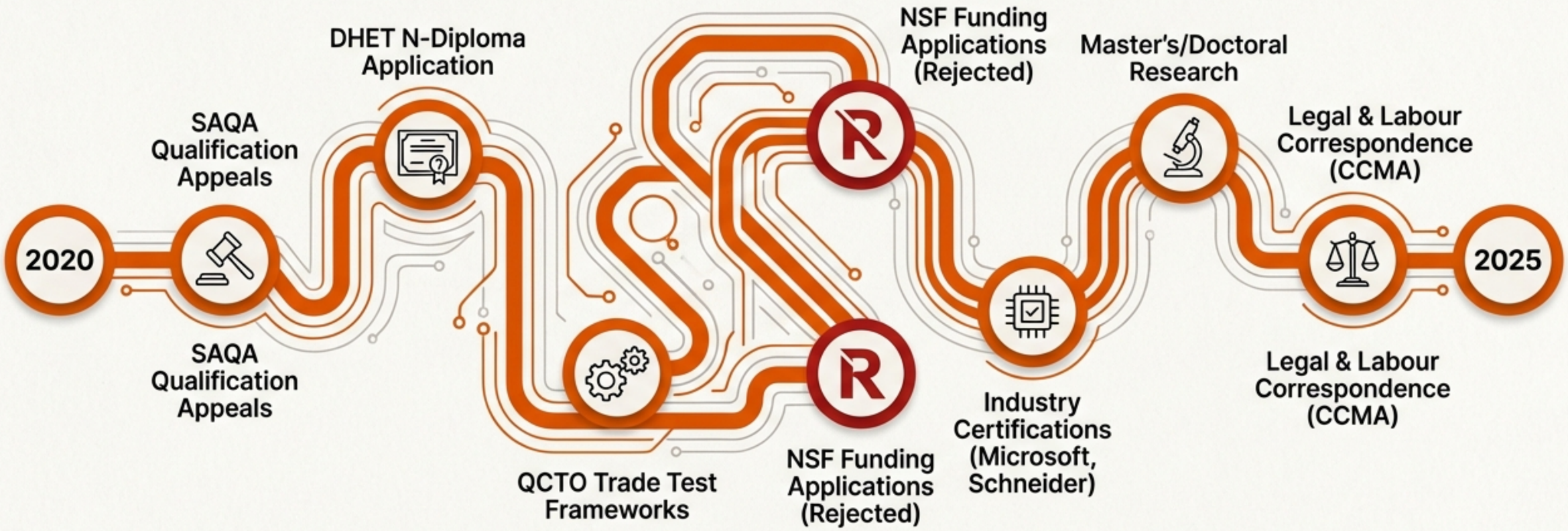
One Practitioner's Journey Through the Labyrinth

This presentation uses a multi-year case study of navigating the TVET system to diagnose its core challenges and propose a robust, integrated solution. The evidence presented is a direct result of this journey.



"The author is not just talking about the problem; he is the evidence."

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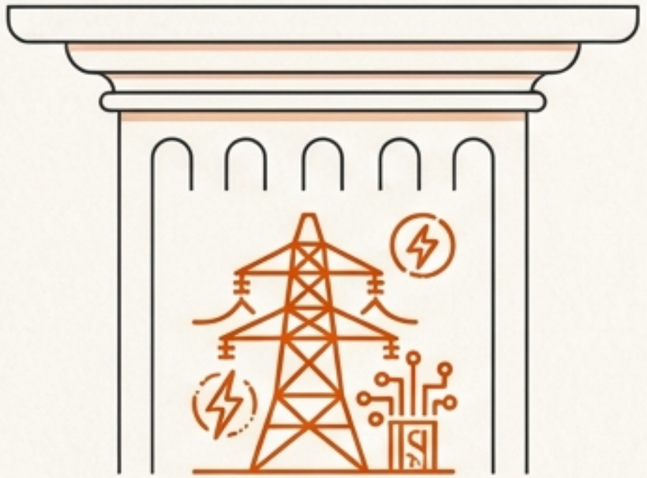
Forging Multidisciplinary Expertise Through Adversity

Navigating the labyrinth of qualifications, funding, and curriculum gaps required the development of a comprehensive skill set far beyond traditional engineering.

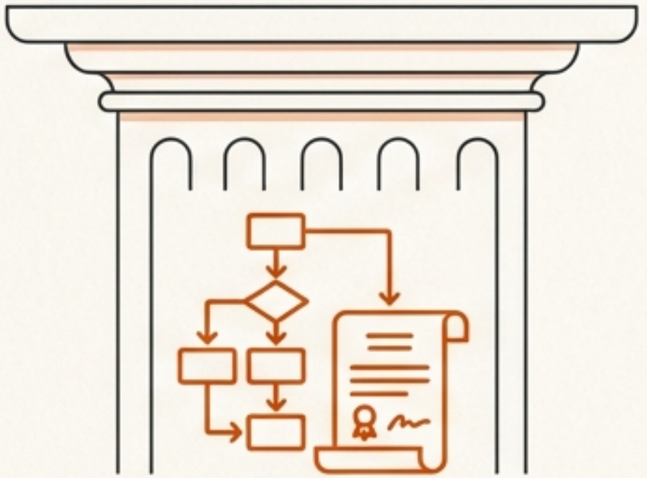


Advanced Engineering & Power Systems

Deepening the core technical domain, with a focus on rural energy, smart grids, and industrial automation.

Digital Systems & Educational Technology

Mastering the digital tools necessary to build modern learning solutions and streamline broken administrative processes.



Policy, Pedagogy & Framework Design

Undertaking formal research into the very systems of education, assessment, and qualification that created the initial obstacles.

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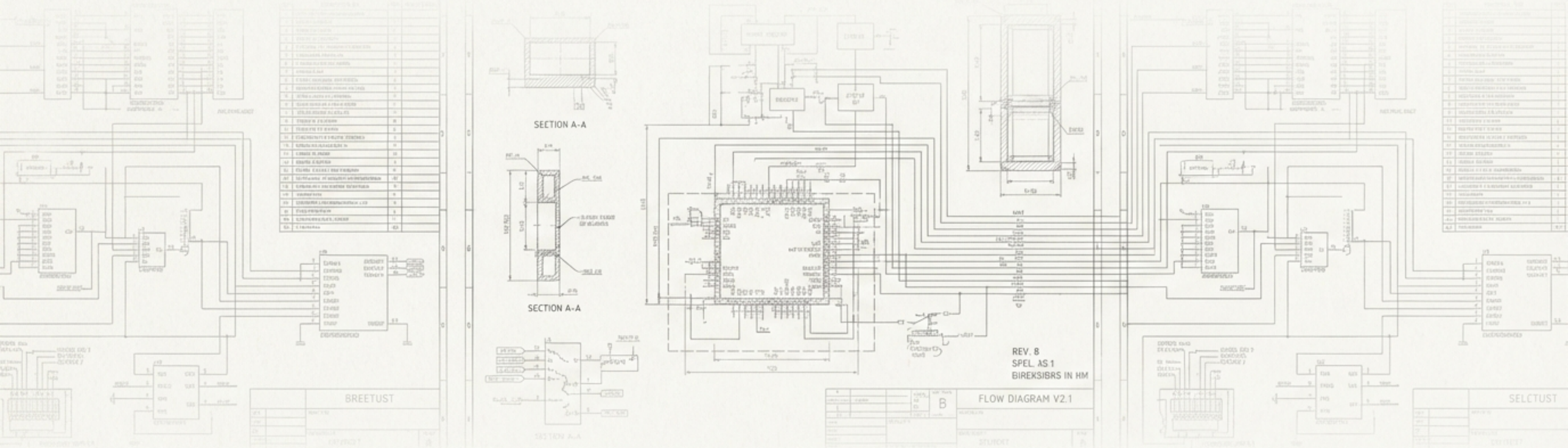
The Audit-Grade Career Engine

A Blueprint for Verifiable Competence



A modular framework that synthesizes formal education, vocational training, and workplace experience into a single, auditable system.

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The Four Pillars of the Career Engine

Foundational Frameworks

Globally recognized, accredited educational bedrock.

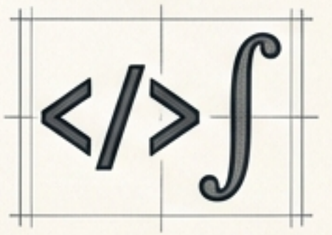
Applied Technical Skills

Hands-on, simulator-based training where theory meets practice.

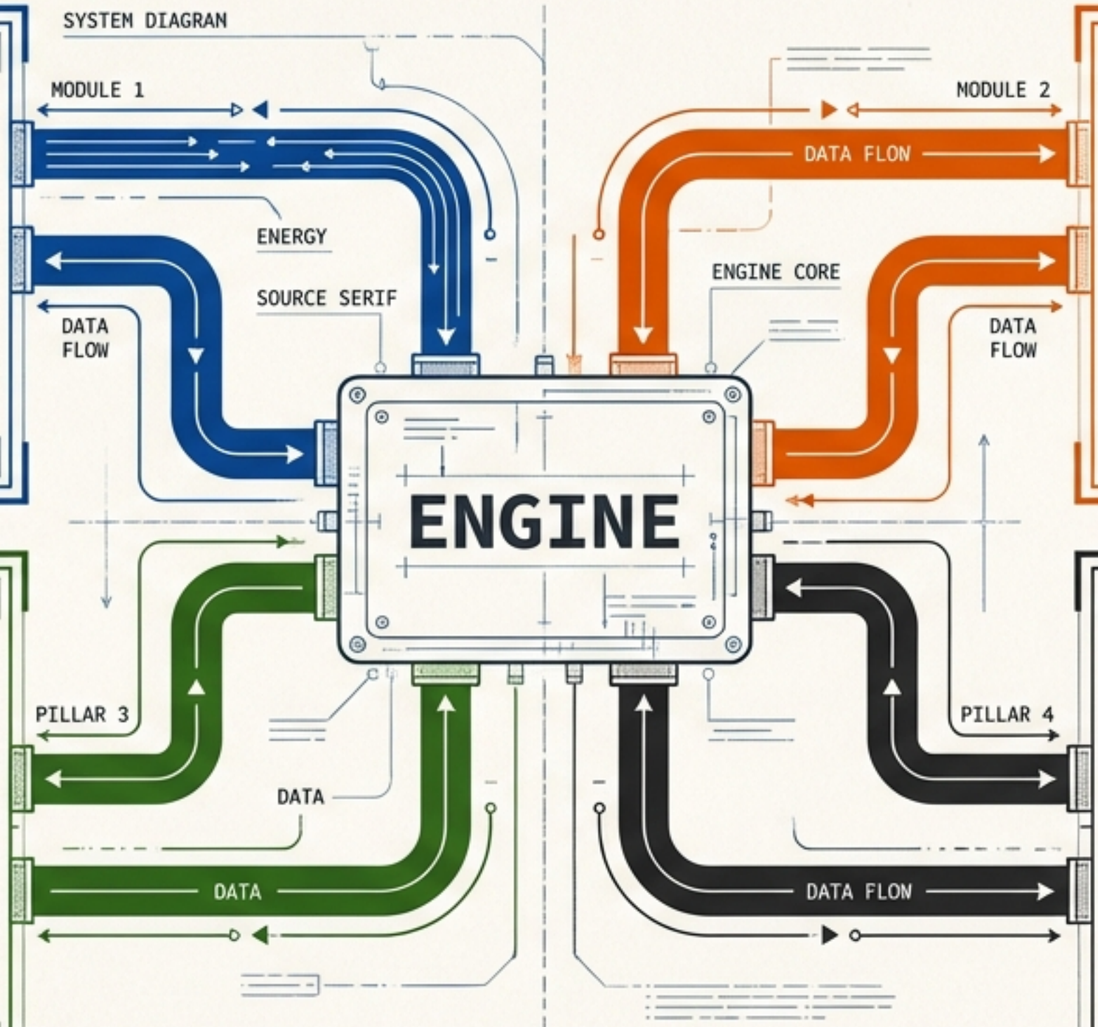
Digital & Professional Competencies

Mastery of contemporary digital tools and professional pathways.

The Unifying Digital Backbone



The intelligent connective tissue that automates, quantifies, and manages the entire system.



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Building on a Bedrock of Global Academic and Technical Standards

Foundational Frameworks (Pillar 1)

South African Qualifications Authority (SAQA)

Qualification	National Certificate: Electrical Engineering (ID 72071)
Unit Standard ID	259037
Title	Design and install electrical wire ways
Level	NQF Level 3
Credits	8

French Higher Education

BTS Électrotechnique - Compétency Block

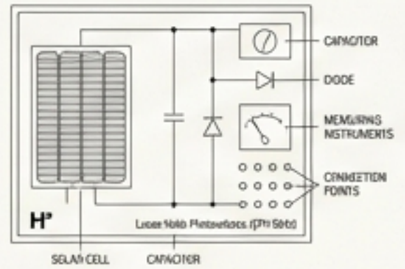
RNCP41007BC01 (in Source Code Pro)

Étude et conception préliminaire d'une installation
(Preliminary study and design of an installation)

Applied Technical Skills (Pillar 2)

German Didactic Systems (Lucas-Nülle)

Leveraging the UniTrain and InsTrain modular learning systems for hands-on experimentation in electronics, automation, and renewable energy. The system includes guided fault simulation and real-time diagnostics.



Indian Vocational Training (ITI)

Incorporating the National Instructional Media Institute (NIMI) curriculum for Electrician Trade (NSQF Level 5), which emphasizes structured practical exercises in wiring, soldering, and workshop safety.

NIMI Curriculum: Electrician (NSQF Level 5)	
Module No.:	3
Module Title:	Wires, Joints - Soldering - U.G. Cables
Allocated Time:	125 Hrs

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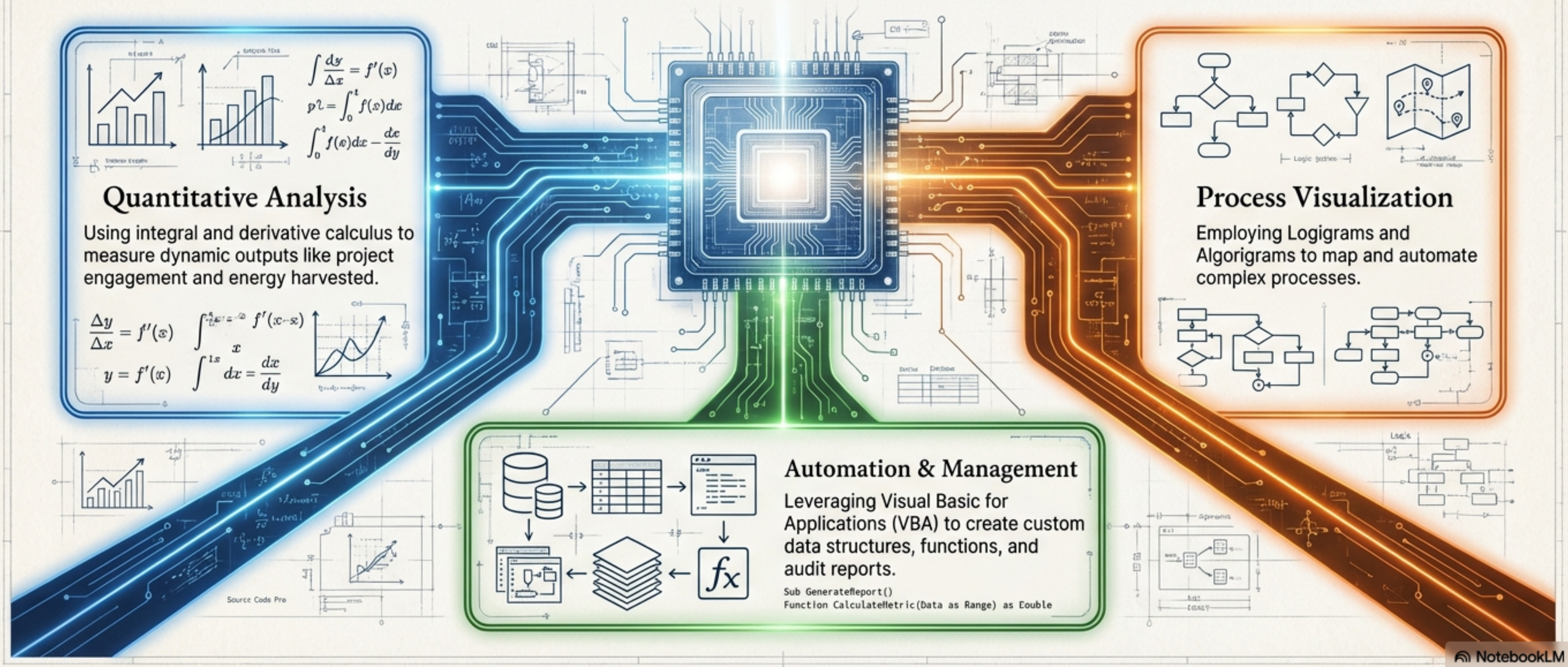
The Unifying Digital Backbone: Intelligent Connective Tissue

This is not just a collection of records; it is a fully integrated system managed by a custom-built digital engine. This backbone automates credential tracking, quantifies performance using advanced mathematics, and visualizes complex workflows.



Quantitative Analysis

Using integral and derivative calculus to measure dynamic outputs like project engagement and energy harvested.

Process Visualization

Employing Logigrams and Algorigrams to map and automate complex processes.

Automation & Management

Leveraging Visual Basic for Applications (VBA) to create custom data structures, functions, and audit reports.

```
Sub GenerateReport()
Function CalculateMetric(Data as Range) as Double
```

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The Engine's Logic: Quantifying Performance with Code and Calculus

Credential & Calculation Tracking

```
' Module: CredentialDashboard
Type CalculationRecord
    DateStamp As Date
    Topic As String
    MethodUsed As String
    SimulationTool As String
    ResultSummary As String
    Award As String
    RewardPoints As Integer
End Type
```

A Quantitative Approach

Total Engagement Over Time:

$$E_{\text{total}} = \int_0^T E(t)\,dt$$

Total Energy Harvested (Wind):

$$E = \int_0^T \frac{1}{2}\rho A v^3 \eta dt$$

Rate of Task Completion: $\frac{dN}{dt}$

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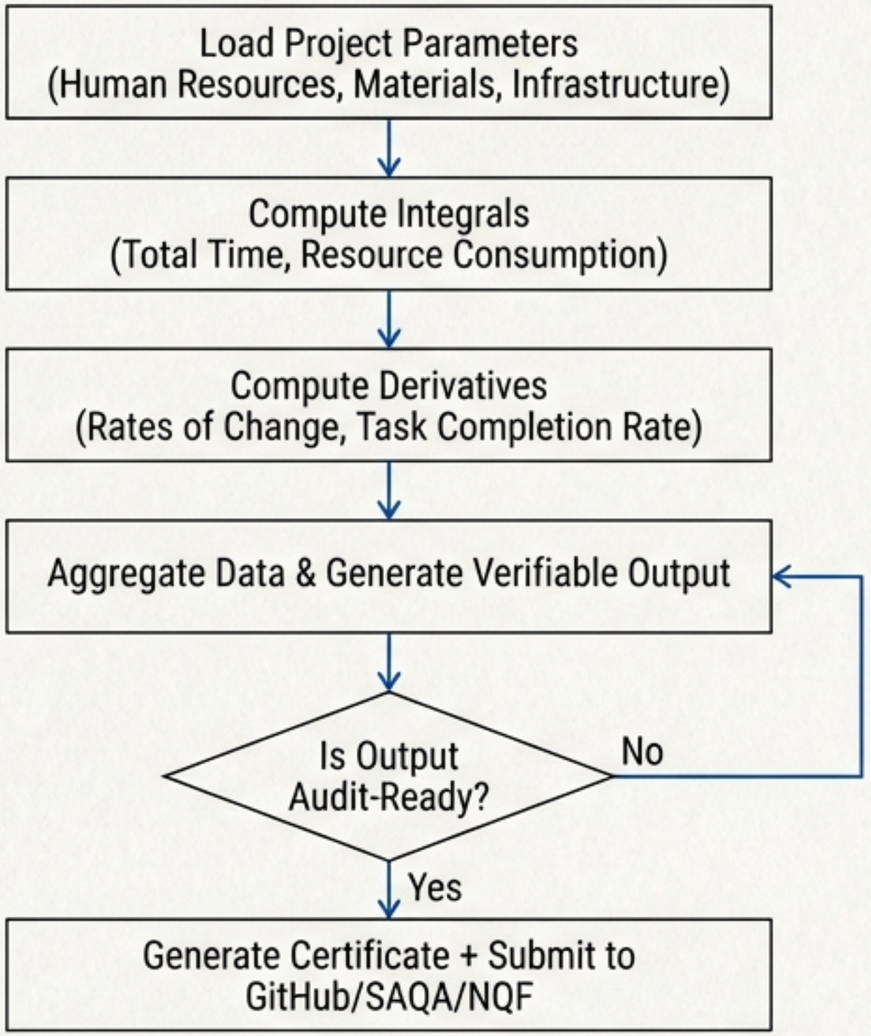
Visualizing the Workflow: An Automated, End-to-End Process



This automated workflow ensures every credential is the product of a traceable, data-driven, and verifiable process.

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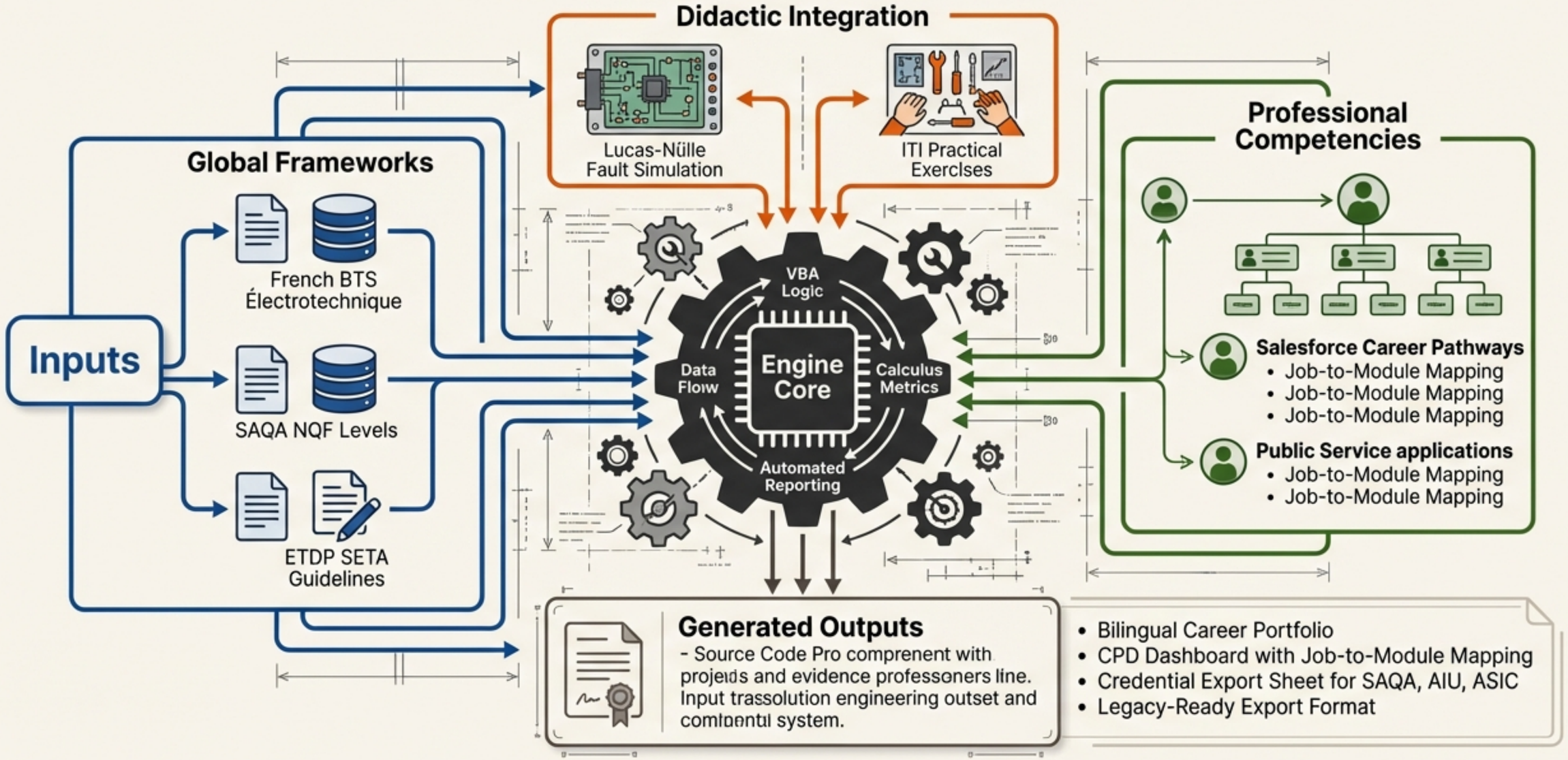
The Complete Blueprint: A Synthesized Career Dashboard



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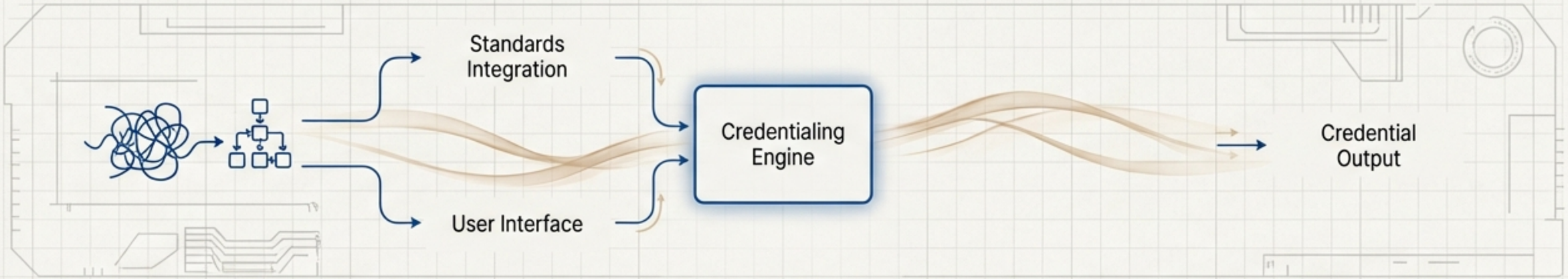
The Result: A Dynamic, Verifiable, and Audit-Grade Professional Identity



Systematic Architecture

Turns the chaos of modern credentialing into an ordered, logical, and automated system.

Cross-Domain Mastery

Proven ability to quantify and validate expertise in engineering, law, education, and technology.

Audit-Grade Traceability

Every skill, competency, and credential is backed by a verifiable data record.

Future-Ready

An engine built for a world of continuous learning, micro-credentialing, and dynamic career paths.

This is the definitive engine for building and managing a modern professional identity—one that is intelligent, integrated, and irrefutable.

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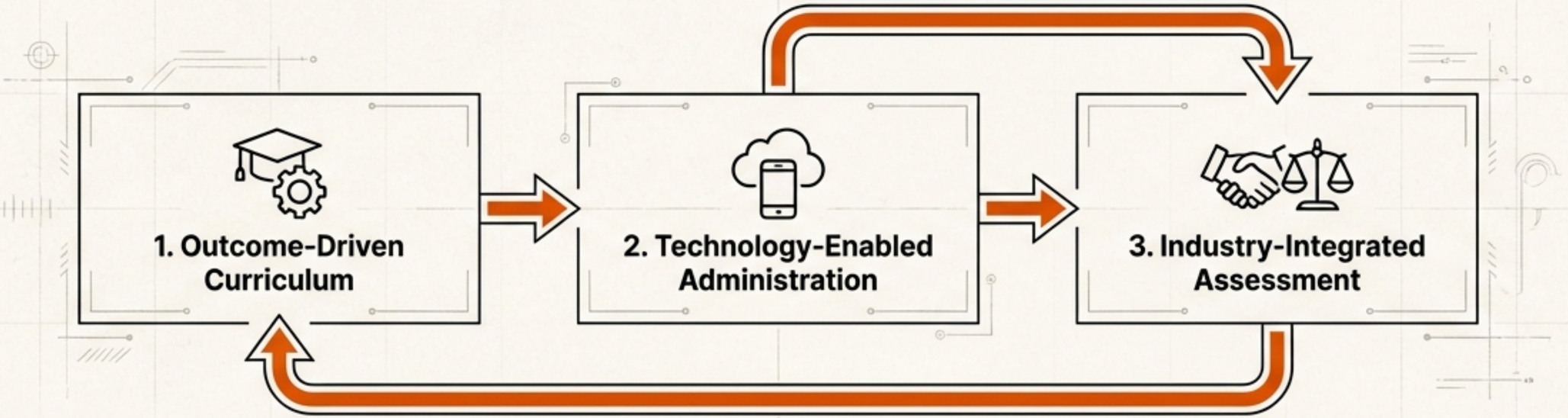
The Blueprint: An Integrated Framework for TVET Engineering Studies

Vision: To create a responsive, technology-enabled TVET ecosystem that seamlessly integrates curriculum, practical experience, and industry needs to produce verifiably competent and employable engineering professionals.



Key Principles

- ✓ **Outcome-Oriented:** Success is measured by real-world competency, not just theoretical exams.
- ✓ **Industry-Validated:** Curriculum and assessments are co-designed and constantly validated by industry partners.
- ✓ **Digitally Integrated:** Leveraging technology (LMS, e-Portfolios, AI) to ensure efficiency, transparency, and data-driven improvement.
- ✓ **Holistic Development:** Combining technical skills with soft skills (communication, problem-solving) and professional ethics.

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The Case for a New Model of Expertise

- The evidence demonstrates a sustained, high-level output of technical and pedagogical work against significant systemic friction.
- This journey has forged a unique, multi-disciplinary expertise that integrates core engineering, curriculum design, and a deep understanding of global qualification systems.
- The challenge is no longer one of validation, but of recognition and engagement. The work stands on its own merit.

Engage the expertise. Recognize the innovation.

Name:
Tshingombe Tshitadi Fiston

Email:
tshingombefiston@gmail.com

Website:
www.tshingombefiston.com

Profile:
archive.org/details/@rdferz

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